



**BHARAT HEAVY ELECTRICALS LIMITED**

CORPORATE RESEARCH & DEVELOPMENT DIVISION  
VIKASNAGAR, HYDERABAD - 500 093, INDIA

PHONES: 23774494 (EXCHANGE)

DIRECT: 23882104/23882204/  
23778474/23776772

FAX : 91 40 23770698

## ENQUIRY

RD:DP:MPX:F-04

To - Enquiry No: 770707321 Enq Date: 08-JAN-08 Due Date: 29-JAN-08 Delivery By:

Pin -

Email :

Attn. .

PLEASE SUBMIT YOUR QUOTATION IN SEALED COVER SUPERSCRIBED WITH ENQUIRY NO, ENQUIRY DATE AND DUE DATE SUBJECT TO OUR TERMS AND CONDITIONS ENCLOSED, FOR THE FOLLOWING MATERIALS SO AS TO REACH US ON OR BEFORE THE DUE DATE BY 12 NOON. THE TENDERS WILL BE OPENED AT 2 PM ON THE SAME DAY

PLEASE GIVE REFERENCE OF ENQ NUMBER , ENQ .DATE AND DUE DATE IN ALL YOUR CORRESPONDENCE FOR PROMPT ACTION. IN CASE IF YOU ARE NOT MAKING THE OFFER PLEASE POST A REGRET LETTER AND RETURN THE DOCUMENTS.

SL NO	DESCRIPTION / SPECIFICATION	UNIT	QTY
1	PROCUREMENT OF STEPPER MOTORS, DRIVERS AND RELEVANT MOTION CONTROL MECHANISMS AND ASSEMBLING THESE STEPPER MOTORS ON THE 660 MM NB VARIABLE AREA ORIFICE VALVES IN THEIR DESIGNATED LOCATIONS AND TESTING THE OVERALL SYSTEM ALONG WITH MOTORS, DRIVERS AND MOTION CONTROL MECHANISMS FOR A SMOOTH OPERATION OF THE VALVES. STEPPER MOTORS AND RELEVANT MOTION CONTROL MECHANISMS SHALL BE AS PER THE TECHNICAL SPECIFICATIONS GIVEN IN THE ANNEXURE - I NOTE: THE PHYSICAL DELIVERY SHALL BE BY 20.03.2008 POSITIVELY	SYSTEM	1
2	COMMISSIONING OF STEPPER MOTORS, DRIVERS AND RELATED MOTION CONTROLLERS LOCATED ON THE 660 MM NB VAVS AT THE DESIGNATED SITE AS PER ANNEXURE - II	SYSTEM	1

NOTE: PLEASE SUBMIT YOUR OFFER IN TWO PARTS AS PER GENERAL TERMS AND CONDITIONS OF ENQUIRY & CONTRACT FOR THE PURCHASE OF GOODS/SERVICES IN SEPARATE SEALED COVERS AS DETAILED BELOW:

1) FIRST COVER SHALL CONTAIN THE FOLLOWING:

a) TECHNICAL COMMERCIAL BID ALONG WITH COMPLIANCE STATEMENTS, MENTIONING APPLICABLE DUTIES, TAXES etc., AND DELIVERY TIME CLEARLY, (TERMS, CONDITIONS, AND COMPLIANCE FORM ENCLOSED)

b) A COPY OF TE PRICE BID WITHOUT THE P RICES (UNPRICED PRICE BID)

2) SECOND COVER CONTAINING PRICE BID

3) IF THE PRICE BID IS FOUND TO BE DIFFERENT FROM THE UNPRICED PRICE BID IN ANY WAY, YOUR OFFER WILL BE REJECTED

4) QUOTE PRICES FOR ALL ITEMS QUOTED BREAKUP

5) PROVIDE LIST OF SPARES (IF ANY) ESSENTIAL FOR TWO YEAR NORMAL OPERATION AND



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QUOTE FOR THE SAME SAPERAETLY AS OPTIONAL

6) PROVIDE LIST OF ACCESSORIES (IF ANY) ESSENTIAL FOR NORMAL OPERATION AND  
QUOTE FOR THE SAME SAPERAETLY AS OPTIONAL

7) GUARANTEE CERTIFICATE : REQUIRED

8) MANUFACTURER'S TEST CERTIFICATE : REQUIRED

Important:

Taxes & Duties quoted by you will be taken for cost evolution and order placement and no change will be entertained later except in the case of changes made by the Government. Changes in Taxes and Duties because of the changes in Turnover etc. also be to the supplier's account. In case no tax/duty is included, a self declaration for the exemption may be attached along with the offer.

AS WE ARE ENGAGED IN R&D ACTIVITY "C" FORM  
WILL NOT BE ISSUED

Yours faithfully  
for

BHARAT HEAVY ELECTRICALS LTD

PLEASE FILL UP THE ENCLOSED VENDOR  
REGISTRATION FORM AND SEND IT ALONG WITH  
YOUR QUOTATION. OTHERWISE YOUR QUOTATION  
WILL NOT BE CONSIDERED. (IGNORE THIS IF YOU  
HAVE ALREADY SUBMITTED THIS FORM)

NARASIMHA RAO V.  
Sr Engineer

Email: raovn@bhelrnd.co.in



**VARIABLE AREA ORIFICE VALVE  
SPECIFICATIONS FOR  
MOTORS, DRIVERS AND MOTION CONTROL  
SYSTEM**

**PROJECT NO :  
QYN 05 662 RD 77  
ANNEXURE - I**

**1.0 SYSTEM DESCRIPTION**

**1.1 PROCESS FLOW SCHEME: (Refer Figure 1)**

- The pulverized fuel (Pf) from the coal pulverizer will flow through four outlets. Each outlet is of dia 660 mm NB (approx.) pipe and each pipe gets connected to one of the burner located at each corner of the furnace. Due to the geometric location, the fuel pipe length varies drastically and thereby fuel flow varies. The pf flow is measured by a flow measurement system and gives an output signal of 4 to 20 mA.
- In order to equalize the fuel flow in all the lines, one no. of variable area orifice valve is provided in each fuel flow pipe. The valves are located at a distance of approximately 250 meters away from the unit control room and have to be programmed to adjust their opening based on 4 to 20 mA signal received from the pf flow measurement system.

**1.2 VALVE MECHANISM: (Refer Figure 2 & 3)**

- Each valve consists of 2 Nos. SS sliding plates 1 & 2 as shown in the drawing and will be initially at their 100% open reference point.
- The movement of the plate (1) is controlled by motors (1) & (2) and that of plate (2) is controlled by motors (3) & (4). Each motor will have one driver. The rotary motion of the motor will be converted in to linear motion through a rack and pinion arrangement.
- The plates will be sliding one over the other, in opposite direction synchronously and travel equidistance in small intervals, towards the centre and back, depending upon the signals received from the pf flow measurement system, via the integrated motion control system.
- The exact movement of the plates at any instance of the time has to be indicated by the Absolute Positional Encoder which is to be provided along with the motor.
- The valve can be positioned in three specific positions:
  - a) Horizontal pipe with valve's sliding plates in vertical position, moving horizontally.
  - b) Horizontal pipe with valve's sliding plates in vertical position, moving vertically.
  - c) Vertical pipe with valve's sliding plates in horizontal position, moving horizontally.

**1.3 OPERATION OF VALVE**

- 1.3.1 When the plates are moving from 100% open reference point to the centre point, Motors (1) & (3) will rotate in clockwise direction and Motors (2) & (4) will rotate in anti-clockwise direction.
- 1.3.2 When the plates are moving from central point towards 100% open reference point, Motors (1) & (3) will rotate in anti-clockwise direction and Motors (2) & (4) will rotate in clockwise direction.
- 1.3.3 The driver should be capable of controlling the rotation of the motors, to a maximum of 0.45° rotation, thereby controlling the linear motion of the plates in either direction. The movements of both plates will be equal but in opposite direction.

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The maximum displacement of each plate from the 100% open reference point is 170 mm (for one rotation of the pinion shaft, each plate will have a linear movement of 198 mm), towards the centre. The driver should not accept any signals beyond 170 mm of movement while closing and similarly it should not accept any signal beyond 100% open reference point, while opening.

Overall dimensions of each of the SS sliding plate are 572 mm X 690 mm X 20 mm, and the distance between the centerline of the plate and each of the pinion central axes is 319 mm. The weight of each SS Sliding plate is approximately 31.5 Kgs. Each plate is driven by 2 Nos. of motors as shown in the Fig. No. 2.

## 2.0 SCOPE

### 2.1 Scope of supply

- (a) Motors with Absolute built in Encoders , brake system and Gear Box if required - 16 Nos,
- (b) Drivers (with Line booster may be given as an optional items if required) - 16 Nos,
- (c) Multi Channel Motion controller - 1 No,
- (d) HMI – 1 No,
- (e) Control panel - 1 No., consisting of the following accessories like Power supply units, MCBs, Relays, Indicating lamps, Push buttons, Switches, Terminals, interconnecting wires and cables etc., (the control panel will be located in the Unit Control Room),
- (f) Local panels – 4 Nos., suitable for terminating armored power cables, screened control cables, line boosters etc. The approximate distance between Unit Control Room and the local panels will be 250 Meters.

### 2.2 Scope of Installation (COMPULSARY)

- (a) Mounting of the motors onto the valve assembly at BHEL R&D for functional checking of all the items in Manual / Auto / Remote mode with simulated signals.

### 2.3 The exclusions in the scope.

- (a) Manufacture, supply and erection of Variable Area Orifice Valve.
- (b) Supply of pf flow measurement system and its erection.

## 3.0 TECHNICAL SPECIFICATIONS

### 3.1

- (a) **Motors: Quantity →16 Nos.**

Type: Standard Hybrid **Stepper Motors** with built in absolute encoders, brake system and gear box if required. The absolute encoders are to indicate the exact position of the plates with respect to the reference point.

Torque: The continuous rated Torque at pinion shaft ends minimum 150 Nm. The stepper motor should be capable of rotating the pinion shaft at the valve end at a minimum speed of 30 RPM.

Maximum allowed rotational angle of output shaft (Gear Box output shaft) for each step of motor is  $0.015^{\circ}$ .

Ambient temperature:  $0^{\circ}\text{C}$  to  $50^{\circ}\text{C}$ .

Environment: Highly dusty environment.

Protection: IP 65

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Frame Size: Suppliers to select from their range. However, the height available to install the motor assembly with motor mounting base will be 500 mm and the frame width should not exceed the edges of the valve. The centre line of the shaft from the valve edge is 72.5 mm.

The required accessories like mounting brackets, flexible couplings, connectors for motors, encoders and brake systems, cable lengths of 20 M.

(b) **Drivers: Quantity → 16 Nos.**

Type: **Stepper Drivers**, to suit the motors mentioned at 3.1(a). These drivers will be mounted in the main control panel which is located in the unit control room. Supplier to select the suitable driver depending upon the motor selected. The driver should be suitable to operate the Stepper Motors at a distance not less than 250 M away from the drivers. (The suppliers may offer line boosters if required and these line boosters have to be located in the local control panel [Refer Clause No. 3.1 f] in the field)

Ambient temperature: 25<sup>0</sup> C to 40<sup>0</sup> C.

Fault Protection: The driver should protect the motor from Line Short circuit, Earth fault, Over Current, Over Voltage and Under Voltage etc.,

Input Signal: To match with the motion controller.

(c) **Motion Controller: Quantity → 1 No.** (See Figure 4) The motion controller should be able to control the motion of 4 VAVs (16 Stepper Motors) with their respective Stepper Motors. To carry out this task, a suitable control system based on PLC may be offered. The supplier should offer suitable software for configuring / programming the logic required into the PLC for the operation of the 16 Stepper Motors. & should have a Human Machine Interface (HMI). The entire motion control system should be programmed in such a way that it should be user friendly. The controller should have Ethernet communication port for configuring, controlling and monitoring the system remotely.

Input Signal: For all the four Channels, 4 to 20 mA from pf flow measurement system (See Figure 4).

**Set Point:** The quantity of 1/4<sup>th</sup> of the total coal mass flow to the mill( dictated by the load on the Boiler) is to be considered as the remote set point for each channel. The set point signal will be 4 to 20 mA.

**Output Signals:** The output signal has to match the driver unit (Selected at item 3.1 (b)). Each of the channels of the controller has to control four motors assigned to it, as per the operation of valve mentioned at section 1.3.

**Feedback Signals:** The controller should be capable to receive feed back signals from the Encoders. Based on the Encoder signals, the position of the valve, Audio visual alarms in case of stalling of any motor, loss of feedback and any other system related faults have to be communicated to the HMI.

**Power Failure Mode:** During Power Failure mode, the motors should be in **stay put condition**. Once the power is resumed, the valve position and the valve position indication should not change. The motors should accept signals from the existing position only. Control action should get automatically modified based on the health of the feed back signals and drivers/motors.

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**(d) HMI (Human Machine Interface) : Quantity → 1 No**

**HMI comprises of:**

- 1.0 Screen of 12.1 inches SVGA touch screen, 800 MHz, 128 MB RAM, PCI Slot, HDD 2.5 inches, EIDE ATA 40 GB, 5400 RPM, 8 MB buffer, Mounting Kit, Cable and the software required for its operation.
- 2.0 The HMI should have communication with the motion control system and should indicate the following:
  1. Coal Mass Flow through each valve
  2. Valve Open % of each valve
  3. Operational status Auto / Manual / Remote
  4. Fault Trip indication of any motor
  5. Signal failure of pf flow sensor
  6. Soft push buttons for internal and external set points and manual operation of valve.

**(e) Control Panel: Quantity → 1 No.**

The main control panel shall be made of sheet steel and will be located in Unit Control Room (UCR). All the drivers, motion controller, HMI, Power supply unit and all the accessories ( like MCB's, Relays, Indicating lights, Cooling Fans, Internal wiring, termination of control and power cables etc.) will be located in this panel. It should be possible to operate the VAV's in manual / Auto / Remote Auto mode from this panel.

**(f) Local Panels: Quantity → 4 Nos.**

The local panels should be of dust proof to IP 65 and be made of sheet steel. One No. each of these panels will be located near one Variable area orifice valve. All the power cables, control cables, encoder cables and line drivers (if required) of the VAV will be terminated in this panel and from here all the cables will run to the main control panel.

**(g) Supply of software needed for proper operation of all the 4 VA Valves as specified under PLC Specifications:**

**PLC System**

The load on the Boiler is dictated by the steam demand. The steam demand decides the burners firing rate. The burners (Four) at any horizontal cross section should burn equal quantity of coal so that the fire ball is located the centre of the horizontal plane.

The boiler steam demand decides the load on each mill. This set value is the input to the main module (in the range of 4- 20mA). The value is shared equally by the four burners which is fed as the set point to the four channel PLC system

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**Step:1** Each channel of PLC system receives the actual process value ( coal mass from ONLINE COAL FLOW MEASUREMENT SYSTEM) at the interval of 10 or +10 seconds. The PLC system calculates the difference value between process value ( actual coal mass flow from Online Coal flow Measurement System) and set point(d). The PLC calculates the number of steps ( + or -) to rotate the stepper motors to move. The constants defined by the programmer should be possible to change from HMI panel.

Two stepper motors which are diagonally opposite will receive one value (Either clockwise OR anticlockwise) and other two diagonally opposite stepper motors will receive opposite signal ( Either anticlockwise OR clockwise). But absolute value of steps will be same for all motors.

The PLC system will sleep till another modified coal mass flow signal is received. After it receive the actual coal mass flow, if the difference between the set value and actual is less than the minimum which will be specified, the control system should be brought to stable state.

The PLC system operates the stepper motors periodically (assumed as 10+ seconds). The period value can be set or modifiable by the commissioning and maintenance engineer.

Fault conditions:

- Failure of the valve due to
  - all the four stepper motors failure
  - three
  - two
  - one
- If any of the stepper motors of the valve does not function remaining motors' input signal should be blocked and audio-visual alarm should function.

General :

Any minor modification in PLC program if required should be carried out by the supplier at the time of testing at R & D and during the commissioning the system in the field of any power plant.

The user should be able to change any constants defined by the programmer from HMI panel.

**4.0 General Terms and conditions:**

- 4.1 The indent is for a total Motion Control System. The items mentioned at section 3.0 are broad indicative only. Any other item required for smooth functioning of the system may also be considered and offered.
- 4.2 The supplier may offer stepper motor and suitable driver, depending upon their product range and suitability of the item. The price may be indicated separately.
- 4.3 The available power supply will be 3 ph, 415 volts, AC, 50 Hz. In case any other power supply is required for operation of the system, the supplier has to arrange for the same.
- 4.4 Any deviation from this specification may be brought out clearly.

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- 4.5 The supplier must show the performance of the system in the power plant, as laid down in acceptance criterion detailed at section 5.0
- 4.6 The supplier should give a guarantee for the supplied items for a period of 18 months from the date of supply or 12 months from the dated of commissioning at the site, which ever is earlier.
- 4.7 The supplier should quote for essential spares for the smooth operation of the motion control system after the warranty period.
- 4.8 The supplier should offer “**OFF THE SHELF ITEMS**” of reputed manufacturer, along with the model / part numbers. The catalogues of all the items are to be enclosed along with the offer.
- 4.9 The schematic drawings of the system offered are to be enclosed along with the offer.
- 4.10 All the detailed drawings are to be submitted by the successful bidder and should get them approved by BHEL, before starting the work
- 4.11 Three sets of all the final drawings, catalogues, manual of software program etc to be supplied in hard copy as well as soft copy along with the supply of material.

**5.0 Acceptance Criterion:**

- 5.1 The supplier should demonstrate the operation of the motion control system on a VAV with simulated pf flow signals at BHEL R & D.
- 5.2 All the pf flow measurements should be displayed on the HMI in engineering units.
- 5.3 The amount of valve opening should be displayed on the HMI in terms of % units.
- 5.4 The valve shall be positioned in three specific positions:
- 5.4.1 Horizontal pipe with valve’s sliding plates in vertical position, moving horizontally.
  - 5.4.2 Horizontal pipe with valve’s sliding plates in vertical position, moving vertically.
  - 5.4.3 Vertical pipe with valve’s sliding plates in horizontal position, moving horizontally.
- 5.5 All the valves shall be checked for their full motions in all the above mentioned positions in point No. 5.4.

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**5.6** Motions of each valve's sliding plates shall be checked for different percentage of openings in all the above positions viz,

- a) 100% opening
- b) 90% opening
- c) 80% opening
- d) 70% opening
- e) 60% opening
- f) 50% opening
- g) 40% opening

**5.7 POWER FAILURE TEST:**

Following tests shall be conducted for all positions of the valves as mentioned in the point No. 5.4

- a) When the power is switched off intentionally to all the motors and motion controllers, the sliding plates shall remain in that stay put condition only.
- b) When the power is switched on, HMI should indicate the current position of sliding plates of each valve.
- c) Next, the control signals shall operate the valve from that current position.

**5.8 BLOCKED MOTOR TEST FOR SINGLE VALVE (REFER FIGURE NOS. 2 & 3)**

Out of all the 4 Stepper Motors of the valves, one Stepper Motor in sequence will be physically blocked and tested for its functionality. HMI should indicate the number of blocked Stepper Motors and should block the control signals to the remaining motors of the valve.

**5.9 BLOCKED VALVE TEST FOR ALL THE 4 VALVES (REFER FIGURE NO. 4)**

In case of blocking of the movement of any one single valve, should also block the remaining three valves and retain their current position till the affected valve is corrected.

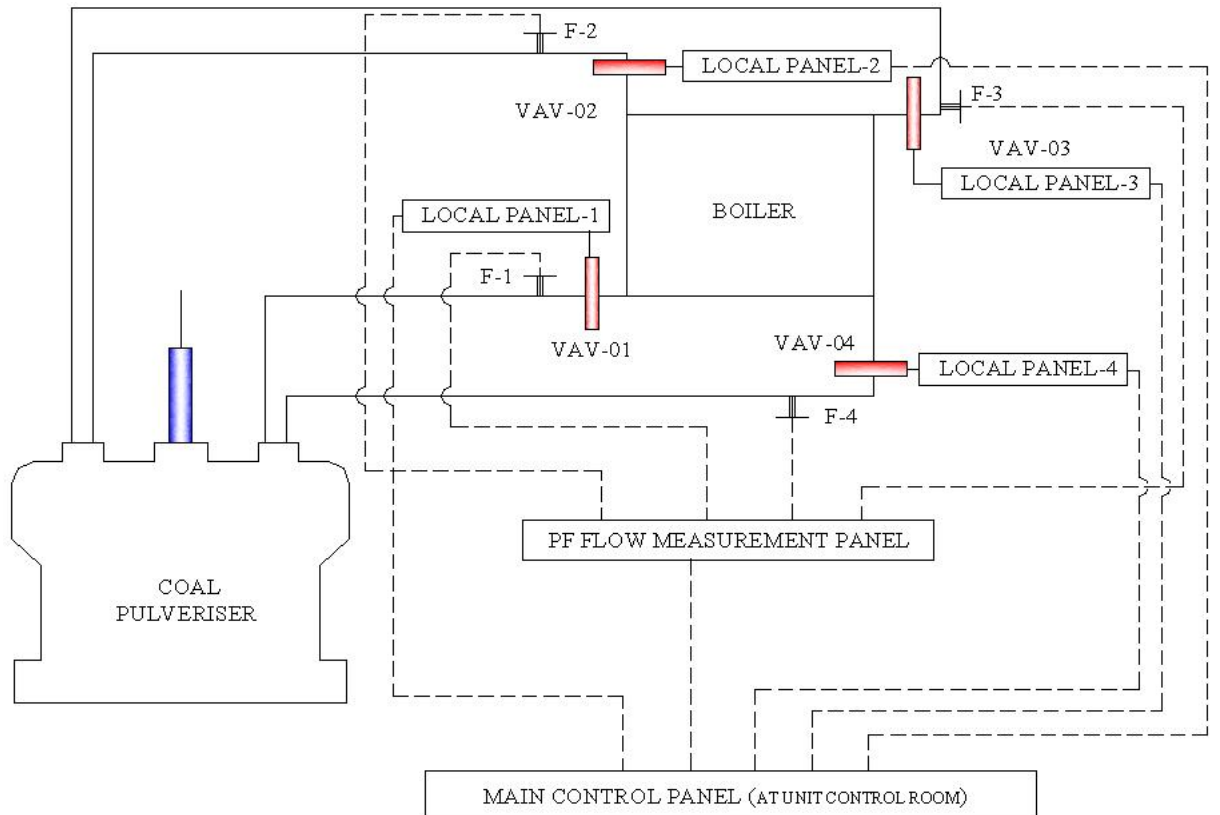
**5.10** Manual Control: Closing / Opening of the VAV moving plates through Forward / Reverse Push Buttons, bypassing the Motion controller.

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**Fig. : 1 PROCESS FLOW SCHEME**

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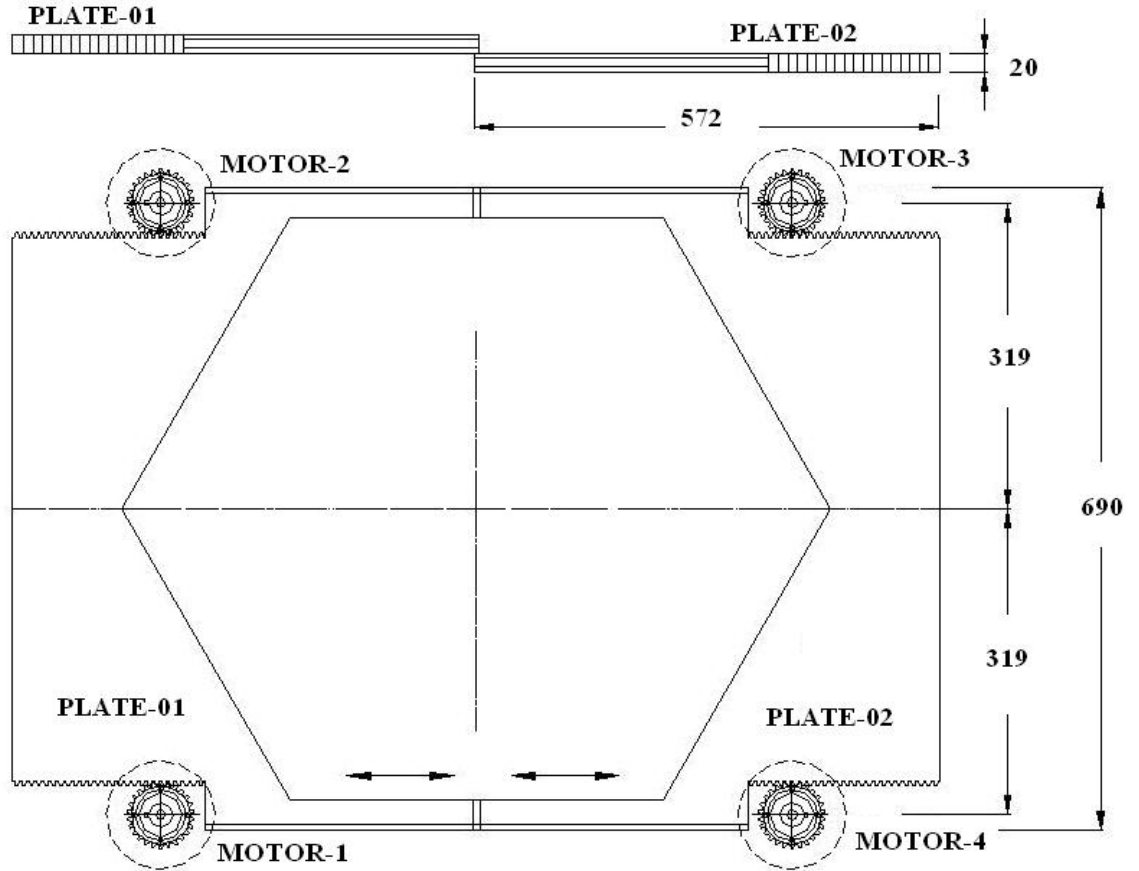


Fig. : 2 VALVE MECHANISM

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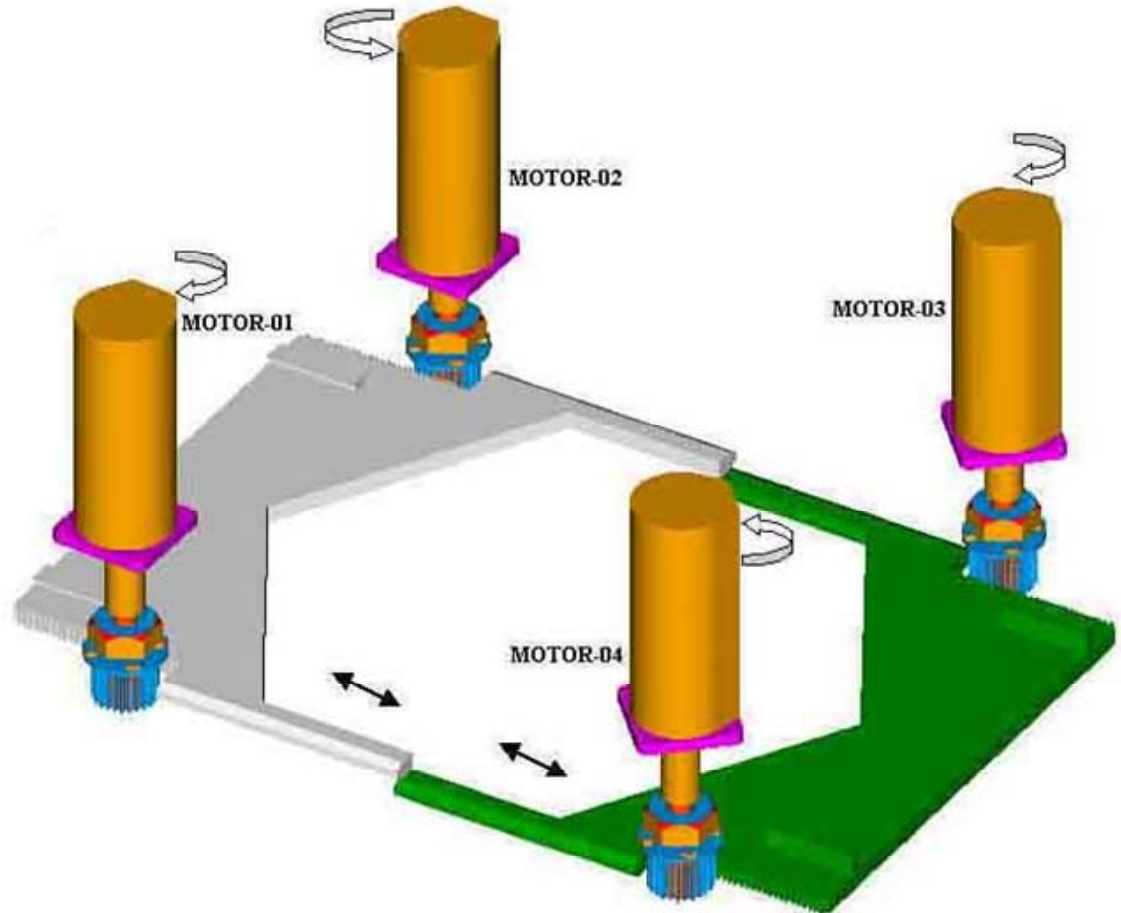


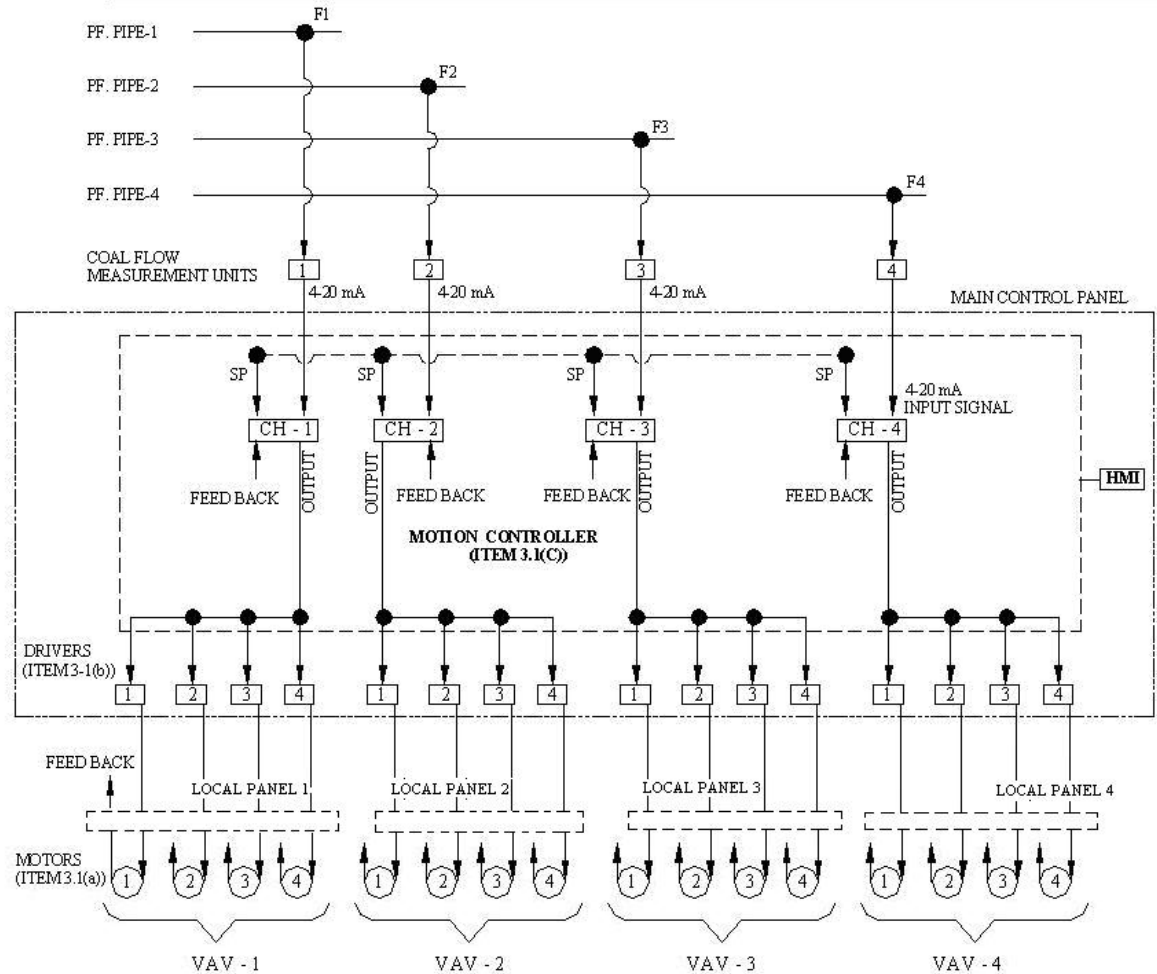
Fig. : 3 ISOMETRIC VIEW OF MOTOR LOCATION

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**Fig. : 4 CONTROL SCHEME**

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**VARIABLE AREA ORIFICE VALVE  
SPECIFICATIONS FOR COMMISSIONING OF  
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ANNEXURE - II**

**COMMISSIONING OF STEPPER MOTORS, DRIVERS AND MOTION CONTROLLERS  
AT A POWER PLANT SITE**

**1 SCOPE OF WORK:**

- 1.1 Checking of the alignment and fixing of motors.
- 1.2 Cable connections and their respective terminations.
- 1.3 After satisfying above 1.1 and 1.2, the commissioning of the system has to be completed as per following acceptance criteria:
- 1.4 ACCEPTANCE CRITERIA
  - 1.4.1 The supplier should demonstrate the operation of the motion control system on a VAV with pf flow signals at Power Plant Site.
  - 1.4.2 All the pf flow measurements should be displayed on the HMI in engineering units.
  - 1.4.3 The amount of valve opening should be displayed on the HMI in terms of % units.
- 1.5 All the valves shall be checked for their full motions in the final erected positions.
- 1.6 Motions of each valve's sliding plates shall be checked for different percentage of openings in all the above positions viz,
  - a) 100% opening
  - b) 90% opening
  - c) 80% opening
  - d) 70% opening
  - e) 60% opening
  - f) 50% opening
  - g) 40% opening

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CORPORATE R&D DIVISION, VIKAS NAGAR, HYDERABAD – 500 093, AP, India

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## General Terms and Conditions of Enquiry & Contract for the Purchase of Goods/ Services

1. The quotation and any order resulting from this enquiry shall be governed by these General Terms and Conditions of enquiry and contract for the supply of goods and the supplier quoting against this enquiry shall, unless specifically stipulates any different terms or conditions, be deemed to have read and agreed to the same.
2. Sealed quotations in double cover with tenderer's distinctive seal, superscribing enquiry number, date and due date are to be submitted so as to reach on or before due date & time, addressed to **Additional General Manager(MM), Bharat Heavy Electricals Limited, Corporate Research & Development Division, Vikasnagar, Hyderabad, Andhra Pradesh, India – PIN-500 093, India.**

In the case of **Two-part bid**, each inner cover shall clearly be labeled as a) **Technical & Commercial Bid** containing technical data/ drawings/ catalogues/ quality plans along with commercial terms and conditions & copy of the price bid with the price columns left blank (unpriced price bid), b) **Price bid** containing prices quotes. Installation and/or Commissioning charges shall be spelt out in absolutely lucid terms, taking into account total charges, rather than quoting vaguely, such as charges per man-day or charges per engineer per day etc. **If the price bid was found later to be different from the unpriced price bid in any way, the offer will be rejected summarily.**

3. **Tender/ Technical bid Opening:** Unless specified otherwise, tenders/ technical bids will be opened on appointed date and time as mentioned in the enquiry or as communicated changed date/time, if any, in the presence of such of those tenderers who may be present.
4. **Delayed/ Late Tender:** Tenders, which have been posted by registered post through the postal department in time before opening date but received after tender opening, shall be treated as regular tenders. Other tenders received after tender opening time shall be treated as late tenders and normally they may be rejected.
5. The Quotation should be free from overwriting and erasures. Corrections and additions, if any, must be attested. Supplier should indicate in the quotation dimensions (Size), weight, rate etc., in the metric system unless the enquiry calls for different unit.
6. **Validity of Quotation:** All quotations shall be kept open for acceptance for a period of ninety days from the date of opening of Tenders/ Technical bid and this shall be deemed to be an express condition of all quotations. The rate shall be quoted in both figures and in words.
7. In the case of Two-part bid, the vendor should furnish technical clarifications, if any, within stipulated time mentioned, failing which, it will be construed that the vendor is not interested in the tender and BHEL shall not consider the offer for further evaluation.
8. **Revision of Pricebid:** In the event of any bidder, after finalizing the technical specifications and scope of supply, opting to revise and submit their latest price bid, then BHEL reserves the right to open their original / previous price bid also while evaluating revised bid.
9. **Pricebid Opening:** Unless specified otherwise in the enquiry, the Price bids of technically qualified vendors shall be opened with prior intimation in the presence of such of those tenderers who may be present.
10. **Conformity to Specifications:** The material should be of the best quality and shall be conforming to our specification given in our enquiry. Unless otherwise agreed upon by BHEL, no payment shall be due by BHEL in respect of any sample. Offers without details of specifications/ applicable catalogues will not be considered and are liable to be rejected.
11. **Terms of Delivery:** All suppliers shall quote the lowest prices on ex-works and FOB/FCA basis. Foreign suppliers will also indicate their Indian agent's name and address with percentage of agency commission out of the quoted price, if any. Name and Address of the supplier's Bankers address should also be given. Indian suppliers for the indigenously manufactured/ imported stock shall quote on Ex-works /Free-on-Rail/Road /FOR-destination basis, indicating packing & forwarding charges, if any, separately.
12. **Taxes and Duties:** Unless specified otherwise in the enquiry, BHEL do not provide "C" or "D" Form as it is engaged in R&D. All Indian suppliers shall clearly mention Sales Tax/ VAT, Excise Duty, and Service Tax etc, if any, payable in addition to the quoted price and indicate applicable rates/ percentage, item-wise. It will be paid

only if Registration Number under State(TIN)/ Central Sales Tax or Service Tax is specifically mentioned in the Bill/Invoice. Vendors without a Sales Tax/VAT registration and applicable Service Tax registration will not be considered.

13. **Insurance:** Insurance will be arranged by BHEL in case of Ex-Works as well as FOB basis supplies.
14. **Terms of Payment:** Full payment will be made within 30 days after receipt, inspection and acceptance of the material (and where involved, Erection and commissioning of the material/ equipment at BHEL/Destination) by Crossed cheque and no Bank commission charges are admissible. The Cheque will be sent by registered post and BHEL is in no way responsible if loss occurs due to delay by postal authorities and cheques falling into improper hands or through forgery or fraud. Suppliers having RBI-SEFT-enabled accounts can seek payment through Electronic Fund transfer. For foreign suppliers, the preferred payment term will be on Sight Draft basis and bank charges inside India will be to BHEL account and outside India will be to supplier's account.
15. Suppliers shall quote competitive price and best delivery for all the items mentioned in the enquiry. BHEL reserves the right to reject partial quotations and to place order on overall landed cost basis. Correct date of effecting supplies in the event of an order should be indicated in the offer. If the supplier's quoted terms are different from BHEL standard payment terms, interest @10.5% per annum (or as indicated in the enquiry) will be loaded to the quoted prices for difference of payment period.
16. **Packing:** The supplier shall be responsible for the goods being properly and adequately packed so as to prevent any loss, damage or deterioration during transit and indicate packing charges, if any, separately.
17. **Part/ Split Ordering:** BHEL reserves right to Order part of the item/ quantity of the enquiry and split the order among qualified vendors.
18. In case the goods enquired are on Rate Contract basis with any other unit of BHEL, such fact should be clearly indicated in the quotation giving full particulars of Rate Contract number, validity and price and also your willingness to comply with order if placed against such Rate Contract. A true copy of Rate contract signed by the supplier should be sent with the quotation.
19. **Inspection:** On receipt, the goods shall be subjected to inspection and also test, if necessary, and our decision regarding the acceptability of the goods shall be final and binding on the suppliers.
20. **Consequences of Failure To Deliver:** The time stipulated for delivery of goods shall be deemed to be the essence of the contract and delivery must be completed within the stipulated date/s. In the event of supplier's failure to supply the goods by the stipulated date/s, BHEL shall be entitled to levy a penalty of ½% per week for the delayed no of weeks or part thereof for the undelivered portion of PO subject to a maximum of 10% total order value.
21. **Withdrawal from the Contract:** In case the supplier withdraws the quotation after its acceptance by BHEL or fails to supply the goods as per the terms and conditions of contract, or at any time repudiated the contract wholly or in part, BHEL shall be at liberty to cancel the Purchase Order and to recover from the supplier the extra cost and other loss incidental to the breach of contract on the part of the supplier.
22. **Guarantee/ Warranty certificate and Manufacturer's Test report:** Invariably in all cases where it is so stipulated, the supplier should furnish Guarantee/ Warranty certificate valid for a period of 18 months from date of supply or 1 year from the date of receipt, acceptance and commissioning(or more, if provide by oem) whichever earlier and manufacturer's Test report along with the goods, failing which, BHEL shall have the right to reject the goods.
23. All ferrous/ non-ferrous items shall be colour coded as per bureau of Indian standards/ or IS standards/ BHEL Standards.
24. **Recovery of Dues:** BHEL shall recover any amount due from the supplier or any amount outstanding to the credit of the supplier with BHEL R&D unit or any other BHEL unit(s) and/or by legal action.
25. **Arbitration & Forum for Legal Proceedings:** All disputes arising in connection with indigenous/ foreign supplies shall be settled through arbitration held at Hyderabad, AP, India and arbitration shall be appointed by Arbitration Tribunal of the Federation of Andhra Pradesh Chambers of Commerce and Industry, Hyderabad, AP, India. The Courts at Secunderabad/ Hyderabad, AP, India shall have jurisdiction in respect of any suit or other legal proceeding arising from or relating to this contract

The rights and remedies of BHEL stated in these General terms and conditions shall be in addition and supplemental to its rights and remedies under law and custom or usage of trade or business and shall in no way be deemed to limit, curtail, supercede or derogate from its said rights and remedies.



**ANNEXURE “AA**  
**BHARAT HEAVY ELECTRICALS LIMITED**  
**CORPORATE RESEARCH & DEVELOPMENT DIVISION**  
**VIKASNAGAR, HYDERABAD – 500 093. INDIA**

**MATERIALS MANAGEMENT DEPARTMENT**  
**(Information for Technical & Commercial bids with general terms)**

**ENCLOSURE TO ENQ No:**

**DATE:**

- a) Please indicate(  ) for applicable or (  ) for not applicable against each clause of the enquiry
- b) Vendor shall confirm their compliance for applicable clauses (  ) in their offer without deviation.

**1) Technical offer:-**

- a) Vendors to confirm compliance to all points of specifications, attached if any. Deviations if any should be specified in the offer.
- b) Vendors shall furnish relevant technical Documents / Catalogues. Drawings and Quality plan duly taking care of Purchase Specification and Quality requirements along with their offer in duplicate for Purchaser’s review / Verification.

**2) Two Part Bid:-**

Vendor shall submit their offer in 2 parts.

**2.1 Technical Bid:-** Containing relevant technical data, drawings, catalogues, Quality Plan etc, along with Commercial Terms and Conditions and a copy of the price bid with the price columns left blank (unpriced price bid). If the price bid was found later to be different from the unpriced price bid in any way, the offer will be rejected.

**2.2 Price Bid:-** Containing the Price(s) quoted. Installation and or commissioning charges shall be spelt out in absolutely lucid terms taking into account the total charges rather than quoting vaguely such as charges as per man day or charges per Engineer per day etc.,

Technical bids will be opened on the due date of the enquiry or any other date fixed by BHEL. Further, vendor should furnish clarifications, if any, required within seven days after the same is sought by Purchaser. If no clarifications/reply received within 7 days, it will be construed that vendor is not interested in the tender and Purchaser will finalise tender accordingly. Price bids received on due date along with technical offers will be recorded and opened subsequently with due intimation to vendors after finalising of technical scope of supply.

These bids shall be submitted in separate sealed covers superscribing the nature of the offer (technical bid or price bid). BHEL Enq No. Due date etc.

**Note: In case of non-compliance with the TWO\_-PART-BID ie.. clause number 2 and subclauses 2.1 and 2.2. Purchaser reserves the right to summarily reject all such offers.**

**3) Delivery:-**

**Vendor shall confirm supply of materials as per the delivery schedule indicated in the enquiry.**

**4) Negotiations:-**

**Vendor shall quote competitive price and best delivery to avoid negotiations.**

**5) Commercial Terms & Conditions:-**

**Terms of Delivery:**

- a) **Vendors shall clearly indicate terms of delivery Viz: Ex-Works/FOR Despatching station/FOR Despatching station FOR Destination/FOB port of loading/FAS Port of loading in their offer. If the terms of delivery is Ex-Works, then vendors shall clearly indicate the following:**
  1. **Packing and forwarding charges.**
  2. **Documentation / Handling charges if any**
  3. **FOB FAS charges (Inland Freight & Insurance charges from vendor works to port of Loading).**
- b) **All Indian Vendors shall clearly specify the Excise Duty in percentage applicable for their supplies. Offers containing expressions such as “Extra as applicable” or “As applicable at the time of Delivery” will be summarily rejected.**
- c) **CST/Local Sales Tax in percentage shall be clearly indicated.**

**6) Validity of Quotation:-**

**Validity of offer should be 90 days after the opening of price bid.**

**7) Part or split ordering:-**

**Purchaser reserves the right to order part of item / quantity of the enquiry.**

**8) For clauses not mentioned in this document see the enclosed “GENERAL TERMS AND CONDITIONS OF ENQUIRY AND CONTRACT FOR THE PURCHASE OF GOODS”**

- 9) **In case your terms of payment are different from our standard payment terms, interest at the rate of 10.5% per annum (or BHEL’s standard rate of interest) will be loaded to your prices for the difference of period of payment.**



**BHARAT HEAVY ELECTRICALS LIMITED**  
**CORPORATE R&D Division**  
**Vikasnagar, Hyderabad – 500093, India.**

**Suppliers' compliance statement to basic conditions of enquiry**

**(In case Order to be placed on Indian supplier in Indian currency)**

<b>Condition</b>	<b>BHEL R&amp; D's terms</b>	<b>Supplier's compliance</b> <b>(indicate Yes/No. if 'No', state terms desired)</b>
1) Validity of offer	90 days from the tender opening date	
2) Delivery requirements	Free delivery at our stores or FOR destination (as indicated in the enquiry)	
3)Warranty	Unless specifically mentioned in the enquiry, all supplied items to be provided with warrantee for one year (or more, if provided by the OEM) from the date of acceptance/commissioning. In case of equipment involving erection and commissioning, warrantee shall be for 18 months from the date of dispatch or 12 months from the date of commissioning, whichever is earlier	
4) Terms of payment	Full payment will be made within thirty days after receipt, inspection and acceptance of the material at BHEL R&D (and where involved, erection and commissioning of the material/equipment at BHEL/destination), by Crossed Cheque and no Bank commission charges are admissible.	
5) Taxes & Duties	Unless specifically mentioned in the enquiry, we do not provide 'C' or 'D' form. Supplier to specify rates of taxes and duties element wise and related percentages.	
6) Penalty for late delivery	0.5% per week beyond the delivery date as mentioned in the Purchase order on undelivered portion subject to a maximum of 10% of the total order value	

\* BHEL R&D reserves the right to reject any offer due to non-compliance with the above conditions and/or non-receipt of this form in duly filled condition

\* Any other elements of cost in addition to the above may please be specified in detail

**(Signature and Stamp/Seal of Vendor)**



**BHARAT HEAVY ELECTRICALS LIMITED**  
**CORPORATE R&D Division**  
**Vikasnagar, Hyderabad – 500093.**

**IMPORTED**

**Suppliers' compliance statement to basic conditions of enquiry**

**(In case Order to be placed on the Principal and foreign currency)**

<b>Condition</b>	<b>BHEL R&amp; D's terms</b>	<b>Supplier's compliance (indicate Yes/No. if 'No', state terms desired)</b>
01) Validity of offer	90 days from the tender opening date ( or as per enquiry)	
02) Delivery requirements	FCA – Nearest International Airport (or as indicated in the enquiry)	
03) Warranty	Unless specifically mentioned in the enquiry, all supplied items to be provided with warrantee for one year (or more, if provided by the OEM) from the date of acceptance/ commissioning. In case of equipment involving erection and commissioning, warrantee shall be for 18 months from the date of dispatch or 12 months from the date of commissioning, whichever is earlier	
04) Terms of payment	Sight draft. All bank charges inside India will be to BHEL R&D account and out side India will be to suppliers account. Documents through State Bank of India, HAL Complex, Balanagar, Hyderabad, AP, India-500 042.	
05) Agency commission	PI specify percentage charges, if any. Indian agency/agent commission will be in Indian Currency only.	
06) Erection/ Commission	As per enquiry	
07) Documentation	As per enquiry	
08) Insurance	BHEL will arrange Insurance based on intimation to our Insurance agency, United India Insurance Co., DO-2, Secunderabad, AP, India.	
09) Penalty for late delivery	0.5% per week beyond the delivery date as mentioned in the Purchase order on undelivered portion subject to a maximum of 10% of the total order value	

\* BHEL R&D reserves the right to reject any offer due to non-compliance with the above conditions and/or non-receipt of this form in duly filled condition

\* Any other elements of cost in addition to the above may please be specified in detail

**(Signature and Stamp/ Seal of Vendor)**



BHARAT HEAVY ELECTRICALS LTD.  
Corp. R&D DIVISION  
VIKAS NAGAR,  
HYDERABAD-500 093 (INDIA)

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**VENDOR REGISTRATION FORM**  
[FORM TO BE SUBMITTED\* BY THE BIDDER ALONG WITH TECHNICAL-BID]

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Before filling please refer to instructions on page-4

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1.0 VENDOR PROFILE:

1.1 & 1.2 Name and address of the vender: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone Nos.:

Fax No.:

Email:

1.4 Local representative of the vender in India/ Hyderabad:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone Nos.:

Fax No.:

Email:

Contact person:

Mobile No.:

2.0 & 2.1 Type of Organisation:

PROPRIETORSHIP	COMPANY	SISTER CONCERN	ANY OTHER (Please specify)
PARTNERSHIP	CORPORATION	Small Scale Industry	

3.0 Annual Turn Over:

Name and address of the Banker:

Sr.No.	Bank	Address

4.0 REGISTRATION PARTICULARS

4.1 IT Permanent Account No.(PAN):

4.2 & 4.3 State and central sales tax Registration No.:

4.4 ED/ Service Tax Registration No.:

PF Account No.:

Labour Licence No.:

ESI Account No.:

5.2 Contact person:

Mobile No. :

5.3 Total Number of employees:

Graduates (Engr./Scientists/Mgmt/Fin.)	Consultants	Workers		
		Sup./Skilled	Semiskilled	Unskilled

6.0 Wish to register for supplies/ services other than one bidding for :

<u>Sr.No.</u>	<u>Service/Supplies</u>	<u>Capacity</u>
<u>1</u>		
<u>2</u>		
<u>3</u>		
<u>4</u>		
<u>5</u>		
<u>6</u>		
<u>7</u>		

6.1 Reference list :

(Only recognized public and private sector companies, attach if printed copy available)

<u>Sr.No.</u>	<u>Customer</u>	<u>Volume / Year</u>
<u>1</u>		
<u>2</u>		
<u>3</u>		
<u>4</u>		
<u>5</u>		
<u>6</u>		
<u>7</u>		

7.0 & 8.0 Infrastructure / facilities :

<u>Sr.No.</u>	<u>Facility (with specifications)</u>	<u>Age/ Year procured</u>
<u>1</u>		
<u>2</u>		
<u>3</u>		
<u>4</u>		
<u>5</u>		
<u>6</u>		
<u>7</u>		
<u>8</u>		
<u>9</u>		
<u>10</u>		

9.0 Registration with other BHEL Unit/Units:

<u>Sr.No.</u>	<u>9.1.1 Unit</u>	<u>9.1.2 Registration No.</u>
<u>1</u>		
<u>2</u>		
<u>3</u>		
<u>4</u>		

Any Other information :

Declaration:

The information furnished above is true and authentic.

**(CEO / Proprietor)**

**SEAL:**

**Date:**

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The competent authority reserves the right to accept or reject the registration. Registered vendors will be informed by mail / email, as convenient. Contact Sr.DGM (MM) for clarification/ additional information on registration.  
A separate communication will be sent to you in case of non-registration, citing reasons thereof.

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**Instructions**

1. Answer all items, use NA for items not applicable.
2. BHEL units do not require this registration.
3. Submit the form in duplicate.
4. Use additional sheets for want of space if required.
5. Attach copies of latest documents in respect of items 4.0 (Registration no.s)
6. Photographs of registered office and the chief executive/proprietor shall be furnished.
7. Use A4 sheets for this document and the enclosures.

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\* REGISTERED BIDDERS, HAVING BHEL (R&D) REGISTRATION NO./ HAVE SUBMITTED THIS FORMAT EARLIER, NEED NOT FURNISH THIS INFORMATION SECOND TIME (UNLESS DESIRE TO UPDATE IT).



**BHEL CORPORATE R & D**  
**VIKAS NAGAR- HYDERABAD - 500 093**  
**ANDHRA PRADESH – INDIA**  
**SUPPLIER REGISTRATION FORM**

(FOREIGN SUPPLIER)

ALL COLUMNS SHOULD BE PROPERLY FILLED IN THE SPACE PROVIDED FOR. WHEREVER IT IS NOT APPLICABLE PLEASE WRITE “NOT APPLICABLE”. INCOMPLETE OR INCORRECT FORMS MAY NOT BE CONSIDERED.

**1.0 GENERAL INFORMATION:**

1.1....NAME OF COMPANY

1.2....DETAILS OF HEAD OFFICE:

ADDRESS :  
TELEPHONE :  
FAX :  
.EMAIL :  
.WEB SITE :

1.3....DETAILS OF FACTORY/WORKS:

ADDRESS :  
TELEPHONE :  
FAX :  
.EMAIL :  
.WEB SITE :

1.4....DETAILS OF MARKETING AGENT

ADDRESS :  
TELEPHONE :  
.FAX :  
.EMAIL :  
.WEB SITE :

1.5 CHIEF EXECUTIVE

NOTE: PLEASE ATTACH SEPARATE SHEETS, IF SPACE FOUND IS INADEQUATE

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AUTHORISED SIGNATORY

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**BHEL CORPORATE R & D**  
**VIKAS NAGAR – HYDERABAD – 500 093**  
**ANDHRA PRADESH – INDIA**

**SUPPLIER REGISTRATION FORM**

(FOREIGN SUPPLIER)

- 1.6 CONTACT PERSON(S)  
FOR PRODUCT OFFERED  
NAME(S)  
OFFICIAL CAPACITY  
ADDRESS:  
TELEPHONE  
FAX  
E-MAIL
- 1.7 YEAR OF ESTABLISHMENT
- 1.8 PRODUCTION CAPACITY PER ANNUM
- 1.9 PARTICULARS OF PRODUCT INCLUDING  
SPECIFICATION AND RANGE OFFERED  
FOR REGISTRATION  
( ATTACH BROCHERS AND CATALOGUE)
- 1.10 NAME(S) OF BANKERS
- 1.11 BANKER'S CERTIFICATE
- 1.12 PORT OF LOADING
- 1.13 NEAREST AIRPORT
- 1.14 NAME OF THE INDIAN AGENT, IF ANY  
WITH AUTHORISATION LETTER
- 1.15 ANY OTHER INFORMATION:

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AUTHORISED SIGNATORY

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**BHEL CORPORATE R & D**  
**VIKAS NAGAR – HYDERABAD – 500 093**  
**ANDHRA PRADESH – INDIA**

**SUPPLIER REGISTRATION FORM**

(FOREIGN SUPPLIER)

**2.0 FINANCIAL INFORMATION**

2.1...TOTAL CAPACITY

2.2...ANNUAL TURN OVER FOR LAST 3 YEARS

2.3...WHEHER CREDIT LICENSE ACCEPTABLE      YES/NO

**3.0 QUALITY MANAGEMENT SYSTEMS**  
ENCLOSED FORMAT PART-B

3.1 EXPERIENCE LIST FOR SAME/SIMILAR ITEMS  
TO BE ENCLOSED

**4.0.....FUTURE EXPANSION PLANS:**  
(GIVE DETAILS)

**5.0 LIST OF ENCLOSURES:**  
INCLUDING BROUCHERS, CATALOGUES, TECHNICAL  
LITERATURE etc...

**6.0 ANY OTHER INFORMATION**

SIGNATURE OF SUPPIER

NAME

DESIGNATION

DATE

.....OFFICIAL SEAL

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AUTHORISED SIGNATORY

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